

ANNEX VII

**TC-1156
Working Paper No 1**

Report of Working Group No. 1 on Contamination

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Discussion of Process

The Working Group was chartered to review the requirements for contamination on packages and conveyances. Additionally, the Working Group was asked to comment and provide advice on the Agency's revised nonpaper on contamination. The Working Group reviewed each of the Papers assigned. During the review specific discussion items were identified and compiled. These items were then group into discussion areas. Discussion areas and items are tabulated below.

Tabulation of Discussion Areas

Discussion Areas	Items
Public Information	Information to Public Agency Nonpaper Notification
Regulatory Text	Proposed ST-2 Text Use of ISO Standards Clarity of Regulations Para 514
Practice	ALARA and Contamination Limits ALARA-and Dose Package Design/Safety/Cleanliness Culture
Model Issues	Inconsistency of Contamination and Exemptions Levels Low-Toxicity Alpha Emitters New Model for Contamination Quantification of Uncertainties Desirable Margins Radionuclide-Dependent Contamination Levels

Specific recommendations of the Working Group are found in the body of the paper and are summarised at the end.

List of Papers Reviewed

The Working Group reviewed the following papers:

WP3	WP4 (part)	WP5
WP5, Add 1	WP6	WP7
WP8	WP9	WP14(part)
IP2	IP3	IP8
IP11	IP19	

Discussion Areas

Information

➤ Information to Public

The Working Group opines that making more information available is a good practice. Some countries already make information on transport, such as noncompliance with the regulations, available to the general public.

The Working Group recommends that information be made available and that a graded system for notification of incidents be used. The system does not need to be regulatory but should be consistent. Notification could be by INES or by

recommendation in ST-2. Since INES is being discussed in TRANSSAC, this subject should be referred to it.

➤ Agency Nonpaper

The Working Group feels that the nonpaper is directly related to the work in the Writing Group on interpretation of the Agency's regulations. The nonpaper should be rewritten and converted to a paper in accordance with those procedures. The Working Group determined that it could not make any changes to the nonpaper in the absence of the procedures. However, the Working Group did develop a paper with the general public as a target audience. This paper explains contamination in a factual manner but provides no interpretation. This paper is found as an attachment to this report. The Working Group advises that it be referred to public relations for further editing.

➤ Notification

The U.S. provides an example of notification in its radiation protection requirements. These requirements contain a check for contamination upon receipt of a package and specific notification for contamination levels exceeding the regulatory requirements. (Reference: Title 10, Code of Federal Regulation, Part 20, paragraph 1906, "Procedures for receiving and opening packages"). These requirements apply to facility procedures.

Regulatory Text

➤ Proposed ST-2 Text

Text for new paras 609.5 and 508.13 was prepared as follows:

609.5 Where it is impractical to design the package so that it can be easily decontaminated, further cleanliness tools to prevent contamination must be included as part of the package safety case. These should be approved by the competent authority and must be taken into account in the operating instructions for the package design (cf para 807(d)). Appropriate quality assurance measures are also necessary.

508.13 No change from WP 4.

These changes need to be proposed by a Member State. Plenary will need to determine which Member States will submit the proposed change.

➤ Use of ISO Standards

The Working Group felt that ISO Standard 7503 on contamination measurements is useful for operational cases. However, this standard is not complete and specific for transport. Incorporation into ST-2 as guidance is appropriate. It is important to note that smearing techniques can be standardised but the measurements themselves can never be duplicated.

The Working Group further noted other ISO standards may apply to transport activities and recommends that consultant services be obtained to identify appropriate ISO standards for use in transport and potential standards that could be applied to transport.

➤ Clarity of Regulations

Clarity of the regulations is important to successful implementation of the regulations. There was a question about the clarity of para 508 and its application. The UK has agreed to review a revision of this para to be provided by WNTI as proposed in IP 11.

➤ Para 514

Para 514 provides for an exception from contamination requirements for internal surfaces of overpacks, freight containers, intermediate bulk containers or conveyances. The Work Group felt that this para, which originally applied to unpackaged LSA-1 and SCO-1 shipments, should be revised. The Working Group considered the following two options:

1. Apply para 514 to external surfaces of packagings, as well. In this case, another contamination limit would need to be applied and there should be a reference to para 572 requiring enclosure of the package. The French competent authority will review a proposal to this end.
2. Revert to the old wording in which para 514 referred to unpackaged LSA-I and SCO-I. A Member State will need to sponsor this change.

The Working Group preferred option 2.

Practice

➤ ALARA and Contamination Limits

ALARA and the current contamination levels can be achieved for most packages. However, there are packages, most notably spent fuel packages, where attempts to achieve the prescribed contamination limits may not be consistent with ALARA. This subject will be discussed later under models.

➤ ALARA and Dose

The Working Group acknowledges that there is a trade off between potential doses to the public versus certain doses to workers. It is essential that worker dose is also considered to ensure that they are maintained ALARA. This subject will be considered under Modelling Issues.

➤ Package Design/Safety Culture/Cleanliness Culture

A safety culture that incorporates good package design and housekeeping minimises many of the problems associated with transport package contamination. The Working Group recommends that the Writing Group in its discussion on notification should draft text that emphasises and encourages companies to develop and implement a good safety culture.

Modelling Issues

➤ Inconsistency of Contamination and Exemption Levels

The Working Group determined that contamination addresses the cleanliness of an operation of a consignor, whereas exemption levels relate to doses to the general public. The Working Group acknowledges that the concepts are different. Maintaining a clean operation ensures that contamination does not contribute significantly to health detriment. The goal of contamination limits is cleanliness of the operations of the consignor. The existing limits have been shown to be acceptable for a safety culture.

In some cases dose optimisation may call for contamination levels above the limits because of high dose rates in the vicinity of loaded packages. Thus the current limits may be incompatible with dose optimisation. In these cases, a Special Arrangement may provide the appropriate regulatory mechanism for ensuring dose optimisation. Under no circumstances should higher contamination levels be a substitute for a good safety culture.

➤ Low-Toxicity Alpha Emitters

There was proposal from France (IP 19) to treat low toxicity alpha emitters the same as all other alpha emitters. It may be simpler to have one alpha limit, but this will be considered under new models for contamination. Such limits should take into account practical implications for bulk shipments of ores.

➤ Desirable Margins

Since contamination levels relate to cleanliness, margins are not important. Nevertheless, it would be useful to understand how exposures from contamination are ranked with exposures from exempt quantities and concentrations.

➤ New Model for Contamination

The Working Group recommends a new model that considers contamination. The purpose of the model is not to establish a limit but to evaluate the radiological consequences of a cleanliness goal. The reasons include the following: dose optimisation, consideration of all pathways, Special Arrangement justification and demonstrating the suitability of cleanliness levels. The modellers should use practical data and Members States are encouraged to make this information available upon request.

In the event of the discovery of contamination levels exceeding the cleanliness goals (limits), e.g. sweatout, the model can be used to assess the radiological consequences of the contamination by replacing assumed values for shipment-specific data. These data would include specification of radionuclides, exposure times, distribution of contamination, and other factors that represent the shipment. The results of the assessment could be used to grade incident.

The model specification that is found in WP 4 is appropriate for the contamination model.

➤ Quantification of Uncertainties

Quantification of Uncertainties will be considered in the new model.

➤ Radionuclide-Dependent Contamination Levels

The Working Group determined that because contamination levels relate to cleanliness, there is no need for radionuclide-dependent contamination levels.

Summary of Recommendations

Recommendation 1: The Working Group recommends that information on contamination be made available and that a graded system for notification of incidents be used.

Recommendation 2: The Working Group recommends that the nonpaper should be rewritten and converted to a paper in accordance with the procedures developed by the Writing Group on Agency interpretation of the Regulations..

Recommendation 3: The Working Group recommends that the attached paper on contamination be made available to the public through the Agency.

Recommendation 4: The Working Group recommended new wording for a new para 609.5 for ST-2 and that proposed para 508.13 was acceptable as written and further recommended that a Member State submit them for revision process.

Recommendation 5: The Working Group recommends that consultant services be obtained to identify appropriate ISO standards for use in transport and potential standards that could be applied to transport.

Recommendation 6: The Working Group recommended that for clarity a Member State should propose new text for para 508.

Recommendation 7: The Working Group recommended that the text for para 514 be revised to apply only to unpackaged LSA-I and SCO-I and recommends that a Member State submit a proposal for the revision process.

Recommendation 8: The Working Group recommends that the Writing Group in its discussion on notification should draft text that emphasises and encourages companies to develop and implement a good safety culture.

Recommendation 9: The Working Group recommends a new model that considers contamination.

Attachment

Statement on Contamination during the Transport of Radioactive Materials

Contamination is the presence of radioactive substances on the external surfaces of a radioactive materials transport package and its conveyance and is subject to regulatory control. The approach to contamination control for packages and conveyances in the International Atomic Energy Agency's *Regulations for the Safe Transport of Radioactive Materials* consists of limits for removable surface contamination with a requirement for keeping radioactive contamination as low as practicable. These limits are derived from models that consider a broad range of situations. Whenever the limit is exceeded the impact of the event is assessed taking into account data pertinent to the situation.

This approach was used in the first Edition of the Agency's Transport Regulations and has remained virtually unchanged up to the present day. The original basis for the removable contamination limits was consistent with the way in which limits for contamination in laboratories, hospitals and industry were determined. Since the first Edition of the Agency's Transport Regulations there have been advances in the assessment of exposures of members of the public and workers arising from the transport of radioactive materials. Calculations using the latest radiological data of the International Commission on Radiological Protection show that the exposures to members of the public and workers resulting from contamination at the regulatory limits remain below the recommended dose limits.

To ensure that contamination levels remain within the regulatory limits the Agency requires that all organisations involved with the transport of radioactive materials implement a quality assurance programme for use of packages. Furthermore, the Agency provides guidance for quality assurance programmes in its document, *Quality Assurance for the Safe Transport of Radioactive Materials*, Safety Series No. 113. Contamination control is an essential part of that programme. Practical experience demonstrates that contamination limits can be successfully applied and that surfaces can be decontaminated to below these limits.

As a result, the majority of packages and conveyances are not contaminated. Packages that are contaminated above the regulatory limits must be decontaminated prior to dispatch. A small number of packages, conveyances and equipment, especially those associated with parts of the nuclear fuel cycle, may become contaminated above the regulatory limits during transport. In such situations the Agency advises the receiving organisation to inform the sending organisation so that the cause of the contamination can be determined and measures implemented to prevent such occurrences in the future. These actions make certain that during radioactive materials transport all exposures of members of the public and workers from contamination will continue to be maintained as low as is reasonably achievable. The Agency will continue to evaluate contamination limits and provide advice and guidance to ensure that high standards of safety for the general public and workers are maintained.

REPORT OF WORKING GROUP No. 2

Issues Relating to ST-1 Requirements for Uranium Hexafluoride

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Mr. R. Boyle (U.S.A.), Secretary
Mr. B. Droste (Germany)
Mr. E. Häggblom (Sweden)
Mr. Y.J. Kim (Korea)
Mr. I. Levin (Israel)
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Mr. M. Pertuis (France) - Part time
Mr. F. Ritchie (Canada)
Mr. V. Roubertie (WNTI) - Part time
Mr. G. Sert (France)
Mr. R. Steane (Canada)
Mr. H. Van Halem (Netherlands)
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1. TASK

The task of the Working Group No. 2 (WG 2) was to address issues concerning the ST-1 requirements for uranium hexafluoride (UF₆), and to provide specific recommendations that will either resolve the issues or will significantly advance their resolution. This version of the working group report reflects discussions during Plenary.

2. REVIEW OF SUBMITTED WORKING AND INFORMATION PAPERS

The chair led an identification and general discussion of the working papers, information papers, and other issues as recommended by the Secretariat concerning the ST-1 requirements for UF₆. The purpose of this general discussion was to come to a common understanding of the depth, nature and number of the issues to be analyzed and to allocate the working group time and resources. This facilitated review of issues by the working group members with the goal of revisiting each issue in detail as the week progressed.

The following working papers and information papers were reviewed :

WP10 Report of the Consultant Services Meeting CS-149 (Secretariat)
IP 1 Extract From Nuclear Fuel - February 7, 2000 (Secretariat)
IP 7 International Transport Safety Research (Secretariat)
IP 12 Implementation of ST-1 Performance Requirements for UF₆ (USA)
IP 16 Background Information for Consideration by Working Group 2

The following is a summary of the Working Groups review of each of these papers.

2.1 WP 10 - Report of the Consultant Services Meeting CS-149

Working Paper 10 from CS-149 presents a review of the historical development of the packaging and transport safety provisions related to UF6 currently in ST-1. The paper identifies a number of primary technical issues and includes a proposed revision to para 632(a) that may serve to resolve these issues.

WP 10 concluded that during the historical development of the UF6 provisions, it was intended to require certain minimum standards for the design of UF6 packages as follows :

1. compliance with ISO 7195
2. compliance with the other ST-1 requirements which pertain to the radioactive and fissile properties of the contents
3. a minimum internal test pressure of 1.4 MPa
4. compliance with the drop test for normal conditions of transport
5. compliance with the thermal test for accident conditions for packages less than 9000 kg
6. a prohibition of pressure relief valves

The Working Group agreed in general with this conclusion, but noted that full compliance with ISO 7195 was not a minimum requirement. Rather, the minimum requirement was to be compliance with ISO 7195 or other international or national standards that provide an equivalent standard of safety. If a standard other than ISO 7195 were used, the package design would require multi-lateral approval.

The WP 10 also concluded that there were three cases where multi-lateral approval would be required :

1. design to national or international standards or technical requirements other than ISO 7195, provided that the ISO standards are met as far as practicable.
2. an internal test pressure of greater than 1.4 MPa but less than 2.8 MPa
3. for packages designed to contain 9000 kg or more, an exception from the thermal test.

The Working Group agreed with this conclusion. These exceptions are defined in paragraph 632 of ST-1.

The WP 10 compared the ST-1 requirements with the what was believed to be the intended requirements. The requirements for UF6 packages are specified in ST-1 paras 629-632. The WP 10 identified a primary issue with respect to para 632(a) which allows UF6 packages to be transported subject to multi-lateral approval if :

ST-1 Text

632(a) the packages are designed to requirements other than those given in ISO 7195 and paras 630-631 but, notwithstanding, the requirements of paras 630-631 are met as far as practicable.

The WP 10 concluded that a liberal interpretation of ST-1, paragraph 632(a) would mean that none of the additional requirements for packages containing uranium hexafluoride would have to be met in full, only “as far as practicable”. In the extreme, this could be interpreted to mean that packages may be provided with pressure relief devices, or may be excepted from the drop test, and be approved as H(M). This is in contradiction to the intended requirements. To correct this apparent loop-hole, the WP 10 proposed the following revised text for para 632(a):

WP 10 Proposal

632(a) the packages are designed to requirements other than those given in ISO 7195 but, notwithstanding, the requirements of ISO 7195 are met as far as practicable.

The WP 10 also suggested that this might be considered as a “change of detail” since the revision is to clarify the intent of the regulations.

The working group agreed that the current text of para 632(a) does not reflect the intent of the requirements and that reference to paras 630-631 should be deleted as proposed. The working group, however, felt that the terms “notwithstanding” and “as far as practicable” were still too open for interpretation and, after much discussion, recommended the following text :

WG 2 Proposal

632(a) the packages are designed to international or national standards other than ISO 7195 provided an equivalent level of safety is maintained.

The working group noted that the intent was to prohibit pressure relief devices in packages for UF₆ even for H(M) packages, however the current text in ST-2 para 631.1 suggest that there may be the possibility to include such devices. The working group recommends that para 631.1 of ST-2 be deleted in future editions.

The working group also noted that the design pressures of 1.4 MPa and 2.8 MPa specified in ST-1 para 632(c) and para 718 are not consistent with the pressures specified in ISO 7195 and ANSI N14.1. ISO 7195 test pressures are specified as 1.38 MPa (200 psig) and 2.76 (400 psig). It seems these numbers were rounded up when incorporated into ST-1. However, this has potentially significant consequence since the thousands of cylinders tested to ISO 7195 or ANSI N14.1 have not been pressure tested to 2.8 MPa, but only to 2.76 MPa (400 psi) and are therefore not compliant with ST-1 requirements. The working group recommends that the design pressure values in ST-1 and ST-2 be revised to the values in ISO 7195. This change could be possibly be considered as an “errata”. The working group also recommended that the Secretariat notify the international organisations of this error so that the changes can be implemented into the 2001 Editions

of their regulations.

WP 10 also presents flowcharts that attempt to describe the decision process of the requirements as currently presented in ST-1 in Figure 1 (of WP 10), and to reflect the actual intent of the regulations in Figure 2 (of WP 10 Add. 1). The working group agreed that a graphical representation of the regulations would be helpful in understanding and implementing the regulations. The working group concluded there were still some minor inconsistencies in the Figure 2 of WP 10 Add. 1 and developed a revised figure shown in Annex 1, which takes into consideration the working groups deliberations on other identified issues. The working group recommends that this figure be used as guidance for preparing proposed changes to the regulations, but cautions that it should not be used to interpret the current ST-1 requirements.

2.2 IP 1 - Extract From Nuclear Fuel - February 7, 2000

This information paper was an article from the trade journal Nuclear Fuel outlining some of the concerns of a European transporter regarding the new requirements for transporting UF₆. The working group noted a number of inaccuracies concerning the implementation dates in the modal regulations and the results of the Tenerife and Peecheur burst tests. The working groups current understanding is that the ST-1 requirements are to come into effect in the modal regulations as follows :

- ICAO Technical Instructions on 1 January 2001 with no transition;
- IMDG Code on 1 January 2001 with a 12 month transition;
- RID/ADR Regulations on 1 July 2001 with an 18 month transition.

The working group noted that the unequal implementation dates may cause difficulties or conflicting requirements. Although TRANSSAC recommended the modal organisations harmonise the implementation dates, this did not happen.

Mr. Sert gave clarification that the 640 C temperature mentioned in the article corresponded to the maximum cylinder shell temperature during the tests. There was further discussion of the Peecheur pressure burst tests, and the working group concluded that these test reports, and the reports of the Co-ordinated Research Program (CRP) contain very important information and insights that should be made available to competent authorities and the industry as soon as possible.

The working group agreed with the general points of the paper, that the ST-1 requirements represent a significant change from the current requirements and that the industry on the one hand, and the regulators on the other need to develop harmonised approaches to implementing the requirements on an urgent basis.

2.3 IP 7 - International Transport Safety Research

The working group briefly reviewed this information paper concerning the CRP on UF₆. The paper indicated that the TECDOC summarising the results of the CRP, including the final reports from each of the six Chief Scientific Investigators (CSI), will not be published until later in the calendar year 2000. The working group recommended that the TECDOC be made available as soon as possible as they contain very important information and

insights required by the competent authorities and the industry.

2.4 IP 12 - Implementation of ST-1 Performance Requirements for UF6

This information paper requested clarification on a number of issues regarding the meaning of the regulations, performance testing and certification of UF6 cylinders. The working group considered each of these questions and the responses are summarised in Annex 2 to this working paper.

Among the main conclusions of the working group concerning discussion of these issues were:

1. The group noted that, subject to detailed confirmation, provisions specified in the current ANSI N14.1 should meet the requirements specified in the ISO 7195-2000 standard, since this edition (soon to be published) has been drafted taking into account the current ANSI N14.1 standard.
2. The English edition of ST-1 Para 805(a) contains a typographical error and should reference paras **629**-631 instead of 623-631 (the French edition is correct). The Secretariat should consider issuing an errata sheet for this and other minor editorial errors that have been identified as in some cases the error could have significant implications. The Secretariat should also consider approaching the international modal organisations to see if it is possible to make these corrections before the modal regulations are published and become law.
3. The working group agreed that all uranium hexafluoride should be shipped under the proper shipping name “uranium hexafluoride” and the communication requirements should be consistent with that choice. The working group could not agree on the packaging issues surrounding this decision and whether or not a UF6 shipping schedule should be developed and reference to UF6 in other shipping schedules should be removed. Since such a change would require a regulatory change proposal from a Member State and the issue would be debated in the revision process, the packaging debate was adjourned.
4. Para 629 does not specify a 0.1 kg mass exception and therefore requires that packages containing less than 0.1 kg of UF6 meet the requirements of ISO-7195. The implication is that small sample tubes may now have to be shipped in an larger 1 inch cylinder. It is recommended that para 629 be changed to except packages containing less than 0.1 kg of UF6 from the requirements for packages containing UF6.
5. The working group agreed that ST-1 does not require the performance tests specified in paras 630(a) – (c) to be conducted in sequence. However, the working group noted that tests are usually conducted using the most conservative approach and therefore sequencing the tests may be appropriate (although not required at this time).
6. There is no cut-off date specified in the regulations for H(M) certificates. Such certificates may continue to be issued and used after December 31, 2003.

2.5 IP 16 - Background Information for Consideration by Working Group 2

This information paper provided background information on the terms “without leakage”, “without loss and dispersal” and “without rupture” in para 630 of ST-1 to assist the working group in addressing the question posed in Information Paper 12. The working group agreed that these terms are appropriately defined in the draft ST-2, however this document is not yet published and therefore not readily available. The working group recommended that ST-2 be published as soon as possible as a matter of the highest priority.

2.6 IP 21 - Implementation of ST-1 Requirements for Natural UF6 in 48" Cylinders

This information raised two questions concerning the approval provisions UF6 packages in para 805 and the grandfathering provisions for packages that did not require approvals under previous editions of the regulations. The working group discussed the certification provisions found in ST-1, paragraph 805 and the transitional provisions found in ST-1, paragraph 815 and determined that both apply to packagings containing UF6. The group notes the certification provisions of paragraph 805 are more specific and restrictive for packages containing UF6 and would therefore supersede the general provisions of para 815.

3. RECOMMENDATIONS

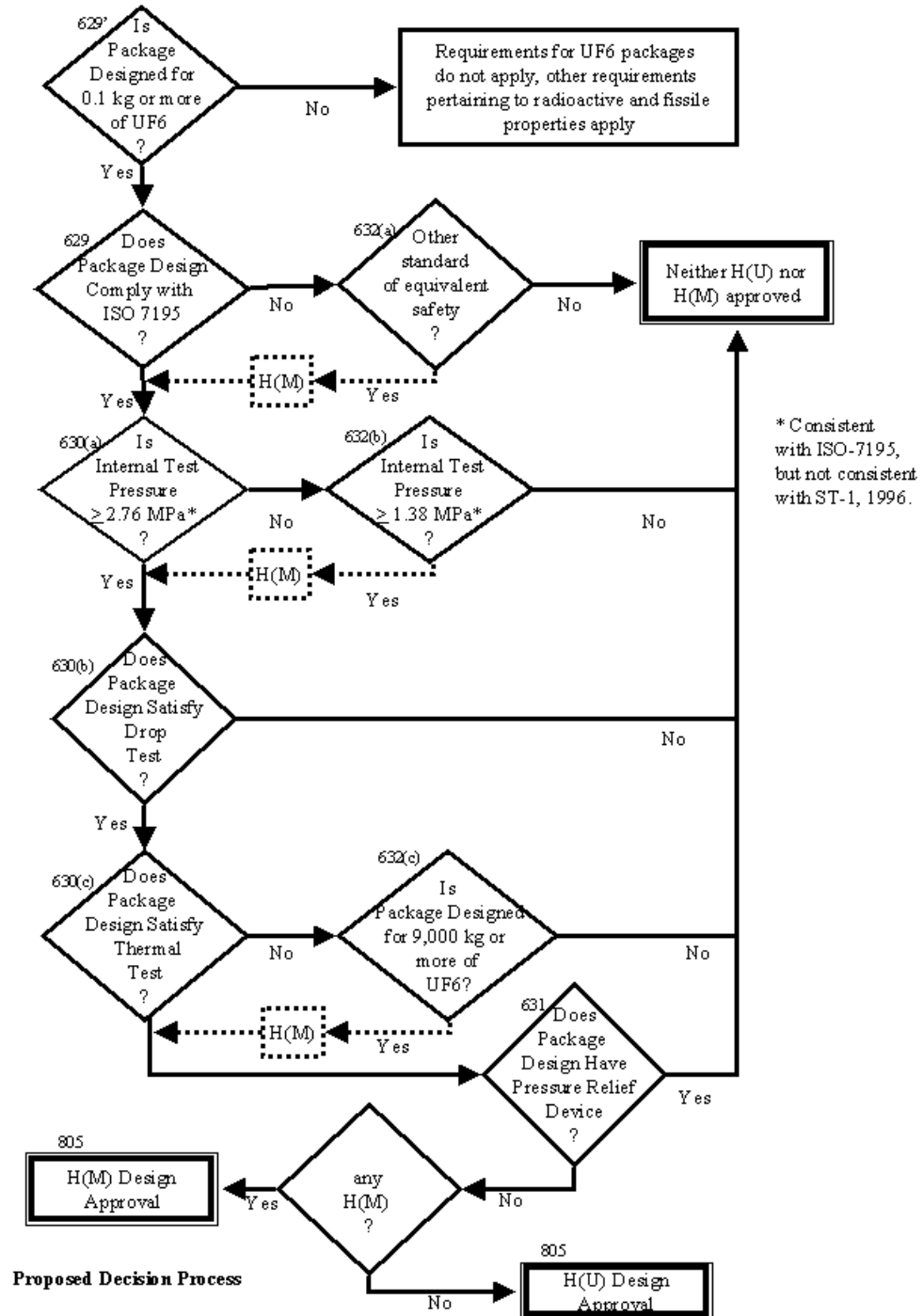
1. To address the finding that that ST-1 and ST-2 did not adequately present the intent of the UF6 packaging requirements, the group recommends the following changes to the next revision of ST-1 and ST-2:
 - (a) ST-1, paragraph 632(a) should be rewritten as follows:

632(a) the packages are designed to international or national standards other than ISO 7195 provided an equivalent level of safety is maintained;
 - (b) ST-1, paragraph 629 should be revised to except packages containing less than 0.1 kg of UF6 from the requirements of ISO 7195.
 - (c) ST-2, paragraph 631.1, the second sentence which explains when pressure relief devices could be used should be deleted.
 - (d) ST-2: a paragraph explaining what is meant by the word “equivalent” used in paragraph 632(a).
 - (e) ST-2: the graphical presentation of the packaging provisions for UF6 (Appendix 1) should be included.
2. To address the inconsistency of the pressures specified in ISO 7195 and ANSI N14.1, the working group recommends that the design pressure values in ST-1 and ST-2 be revised to the values in ISO 7195. The group believes this can be considered as minor

change or change of detail. The group further recommends that the Secretariat notify the international organisations of this error so that the changes can be implemented in the 2001 editions of their regulations.

3. To improve the understanding of the need for and benefit of the new UF₆ packaging regulations, the group recommends that the Secretariat publish the final report of the Co-ordinated Research Program (CRP) on Uranium Hexafluoride as soon as possible.
4. To address the difficulty in understanding and applying the new UF₆ packaging regulations, the group recommends the Secretariat and Member States review the conclusions detailed in Sections 2.4 and 2.6 as well as the issues addressed in Appendix 2 and include them in the next draft of ST-2.
5. To address the identified need for uniform implementation of the ST-1 regulations, the working group recommends that ST-2 be published as soon as possible as a matter of the highest priority.
6. To modify the English edition of ST-1 Para 805(a) showing reference to paras **629**-631 instead of 623-631 (this should be handled as a Minor Change and included in an errata sheet).

Appendix 1 **Graphical Representation of the Packaging Requirements for UF6**



Appendix 2
Working Group Responses to Questions Raised in
Information Paper No. 12 (USA) and Information Paper No. 21 (Canada)

Issues Regarding the Meaning of the Regulations

Issue 1: Paragraph 632(a) references packages designed to requirements other than ISO 7195. Many believe this to be a reference to ANSI N14.1. Is ANSI N14.1 an acceptable alternative to ISO-7195 and are there other acceptable standards?

The group noted that, subject to detailed confirmation, provisions specified in the current ANSI N14.1 should meet the requirements specified in the ISO 7195-2000 standard, since this edition (soon to be published) has been drafted taking into account the current ANSI N14.1 standard.

Issue 2: Why does paragraph 805(a) of ST-1 refer to packaging standards for LSA when listing the packaging standards for uranium hexafluoride?

After discussing this issue within the working group and consulting with the Secretariat, the working group confirmed that ST-1 paragraph 805(a) should reference only paragraphs 629 - 631 and its reference to paragraph 623 - 631 is a typographical error. The working group continued to recommend that the Secretariat should prepare and distribute a list of minor changes and changes of detail that have been approved ST-1.

Issue 3: Is it appropriate to ship non-fissile or fissile excepted uranium hexafluoride as LSA in appropriate LSA packaging?

The working group noted that the U.N. Orange Book requires all uranium hexafluoride to be shipped under the proper shipping name “uranium hexafluoride” and the communication requirements should be consistent with that choice. The working group could not agree on the packaging issues surrounding this decision and whether or not a UF₆ shipping schedule should be developed and reference to UF₆ in other shipping schedules should be removed. Since such a change would require a regulatory change proposal from a Member State and the issue would be debated in the revision process, the packaging debate was adjourned.

Issue 4: Could you define the term “as far as practicable” which is used in ST-1, paragraph 632(a)

In its work on design requirements (see issue 1), the group decided that the term “as far as practicable” was unnecessary and removed it.

Issue 5: How are packagings which contain less than 0.1 kg of UF₆ to be packaged?

The working group agreed that ST-1, paragraph 629 requires packagings containing less than 0.1 kg of UF₆ to meet the requirements prescribed elsewhere in the regulations which pertain to its radioactive and fissile properties.

Issue 6: In order to adequately present a complete perspective of the benefits of these new requirements, what research documentation is available to Competent Authorities?

The working group identified two research reports which would be very helpful to Competent Authorities: The report of the IAEA Co-ordinated Research Program on UF₆ and a report of French Burst Testing. The working group requests the Secretariat take all possible efforts to issue the CRP report as soon as possible. The working group participant from WNTI agreed to submit the article on French burst testing (which will soon be published to in a trade journal) to TRANSSAC as an information paper.

Issues Regarding the Performance Testing of UF₆ Packages

Issue 1: ST-1 clearly requires performance testing of uranium hexafluoride cylinders. Do these performance tests need to be conducted in sequence?

The working group agreed that ST-1 does not require these tests to be conducted in sequence. However, the working group noted that tests are usually conducted using the most conservative approach and therefore sequencing the tests may be appropriate (although not required at this time).

Issue 2: ST-1, paragraph 630 uses the terms “without loss”, “without loss or dispersal”, “without rupture” in conjunction with the required performance tests. Could you provide additional guidance on these terms?

The working group agreed that paragraphs 630.2, 630.3, 630.4, and 630.5 of ST-2 (not yet published but available to the working group) appropriately define these terms and their applicability and use in performance testing of UF₆ packagings. Please note that IP-16 also supports this position.

Issue 3: What margins of safety are appropriate if one actually performs a thermal test on a UF₆ package (a test is conducted on an actual cylinder containing UF₆)?

The working group agreed that the ST-2 guidance for paragraph 728 adequately addresses its views on thermal testing and the need for (or lack of) additional safety margins.

Issues Regarding the Certification of UF₆ Packages

Issue 1: Since it is very likely a H(M) certificate(s) for packagings containing UF₆ will have to be issued and revalidated in the near future, who is responsible for issuing the original certificate?

The working group agreed that, consistent with IAEA packaging certification practice, the originator of the design shall issue the original certificate. The U.S. representative on the working group stated that they planned to issue an original certificate(s) for packages designed to the ANSI N14.1 standards.

Issue 2: Was the intent of paragraph 805 to encourage, if not require, cylinders to fully comply with para. 630 and be certified with H(U) certificates or is it acceptable to use H(M) certified cylinders for an indefinite period?

The working group agreed that there is no prohibition from continued use of H(M) certificates. Since the guidance material associated with paragraph 805 may lead some to believe that H(M) certificates should be phased out in favour of H(U) certificates, the working group recommends that any Competent Authority planning to make extended use (over 5 years) of H(M) certificates should contact their fellow competent authorities to determine their willingness to provide multilateral approvals.

Issue 3: Since the certificates, safety analysis reports, and certificates for packagings containing UF₆ will be reviewed and discussed worldwide. What data and analysis should be included in the safety analysis report?

The working group agreed that these packages should be treated consistently with other package types requiring Competent Authority approval. The safety analysis report should include all information and test data that demonstrates the design meets the requirements of ST-1. This would include: proof of certification to ISO or other design standard, proof of successful completion of performance testing, and details of applicable quality assurance program. The group also agreed that ST-2, paragraph 632.2 is applicable. Although not exclusively related to this issue or package type, the working group agreed that it would be worthwhile for the Secretariat to develop a guidebook which describes what should be included in an application and safety analysis report for each type of approval issued by a Competent Authority.

Issues Regarding the Grandfathering Provisions for UF₆ Packages

Issue 1: The 1985 Edition of Safety Series No. 6 (as amended 1990) did not require Competent Authority approval for packagings containing UF₆, what are the appropriate transitional arrangements for packagings for UF₆?

The working group discussed the certification provisions found in ST-1, paragraph 805 and the transitional provisions found in ST-1, paragraph 815 and determined that both apply to packagings containing UF₆. The group notes the certification provisions of paragraph 805 are more time restrictive than the transitional provisions and therefore somewhat supersede the transitional provisions.

REPORT OF WORKING GROUP No. 3

Members:

Mr. H. Sannen (Belgium), Chairman	
Mr. R. Lewis (U.S.A.), Secretary	
Mr. Bayley	Mr. Hughes (part time)
Mr. Blalock	Mr. Malesys (part time)
Mr. Duchàèek	Mr. Pollastri (part time)
Mr. Faille	Mr. Sert (part time)
Ms. Kimmel	Mr. Van Halem (part time)
Mr. Köksal	Ms. Wiegel (part time)
Mr. López-Vietri	Mr. Young (part time)
Mr. Noyes	Mr. Nitsche (part time)
Mr. Pawlak	Mr. Stewart (part time)
Mr. Ridder	
Mr. Sáfár	
Mr. Tisdall	
Mr. Trivelloni	
Mr. Tshuva	
Mr. Yamaji	
Mr. Zamora	

Task:

The task of the Working Group No. 3 is to review and make recommendations on multiple issues, including:

- regulations for the transport of fissile material by air
- fissile material definition and exceptions
- transport of consumer products
- multilingual labeling of packages
- practical application of transport regulations
- enhanced immersion performance of packages
- two-year revision cycle

Introduction:

The chair led an identification and general discussion of the issues as identified in Working Papers (WPs) and Information Papers (IPs) recommended by the Secretariat. The purpose of this general discussion was to come to common understanding of the depth, nature, and number of the issues to be analyzed and allocate the working group

time and resources available. This facilitated review of issues by the working group members with the goal of revisiting each issue in detail as the week progressed.

A decision was made to not employ subgroups for WG-3.

General Discussion of topical issues

(1) Regulations for the transport of fissile material by air

WP-12, “Consolidated Summary of Statements on Criticality Safety for Fissile Material Shipments by Air,” is a compilation of communications on this topical issue that indicates that there is currently considerable confusion and a lack of consensus as to how to implement the requirements of ST-1 para 680.

IP-10, “Air Shipment Criteria on Adoption of ST-1,” was presented to initiate discussions on this topic. The chair recounted the history and basis for ST-1 para 680. IP-15, “Background Information for Working Group 3 Concerning Criticality Safety,” also provides this history. If shipping fissile material by air, quantities greater than excepted amounts require the evaluation under para 680. As a practical matter, all uranium can be shipped in non-Type C package (IF, AF or BF). Type C packages are necessary if the contents exceed 3000 A1 or 100,000 A2, whichever is lower, for special form; or 3000 A2 for other form material.

A short summary of the reasons behind this requirement was recounted. Taking into account that the accident forces of an air accident could be more severe than those for other modes of transport, it was decided during ST-1 development that the regulations should address the shipment of fissile material by air that does not require Type C packages. It was obvious that as a result of a severe air accident, the forces on a Type IF, AF, or BF package might be more severe than those represented by the hypothetical accident conditions. Therefore, the previous regulations did not completely reflect these more severe air accident forces in order to protect against criticality accidents. The supplementary requirements of para 680 were adopted.

As a practical matter, the more stringent para 680 requirements do not affect materials such as low-enriched uranium that require water moderation for criticality. This was the approach used because of: (1) the low probability and consequences of a criticality following an air accident with fissile material, and (2) the consequences of water-moderated criticality accidents would be lower than the consequences of other criticality accidents. A thermal (water-moderated) criticality would result in a number of fissions that is orders of magnitude smaller than a criticality without water moderation. Protection from more severe criticality events, due to mechanical rearrangement of the geometry of the package, is the objective of the supplementary requirement of para 680(a). Again, certain materials, such as low-enriched uranium, cannot sustain criticality without water moderation. Thus, the new para 680 requirement should not have a practical impact upon these shipments.

This issue is not clear in either ST-1 or draft ST-2. Draft ST-2 para 680.2 discusses this issue but not with sufficient clarity. The WG-3 believes the approach to meeting the

fissile/air test should be: rearrange package contents into most reactive (but dry) geometry, leave out packaging components that reduce reactivity (poisons), but keep in moderators or other features that increase reactivity if they are already present. After including a reflection by 20 centimeters water, but no water ingress, the system must be demonstrated to be subcritical.

The consensus position of WG-3 is that the application of the paragraph 680 (Type C) requirement to fissile-by-air packages is in addition to the normal condition tests (and possibly accident tests) that the package already must meet. However, the performance is evaluated only with respect to subcriticality evaluation as required in para 680. Thus,

- A Type IF or AF package by air is required to:
 - (1) withstand incident-free conditions of transport with respect to release, shielding, and maintaining subcriticality (single package and 5xN array),
 - (2) withstand accidental condition tests with respect to maintaining subcriticality (single package and 2xN array), and
 - (3) comply with para 680 with respect to maintaining subcriticality. (single package)
- A Type BF package by air must:
 - (1) withstand incident-free conditions of transport and Type B tests with respect to release, shielding, and maintaining subcriticality (single package and 5xN array/normal and 2xN array/accident), and
 - (2) comply with para 680 with respect to maintaining subcriticality. (single package)
- A Type C fissile material package must withstand
 - (1) Incident-free conditions of transport (single package and 5xN array), Type B tests (single package and 2xN array), and Type C tests (single package) with respect to release, shielding, and maintaining subcriticality.

In determining compliance with para 680(b), the “Water inleakage” should be interpreted as more for theoretical use in describing the calculational model. Para 680(b) should be interpreted such that, if credit is taken for “special features,” this can only be done for packages presented for air transport, if it is shown that these features remain effective even under the Type C test conditions. WG-3 believes, at a minimum, that ST-2 needs to be clarified to better explain the requirements and use of the requirements of para 680. WG-3 recognizes that it is not practicable to include such clarifications prior to publication of the current draft ST-2.

Proposal

The WG-3 recommends that expert(s) be identified to develop additional guidance, for possible inclusion into a future revision to ST-2, regarding:

- a. the intent of the evaluation under para 680
- b. the safety basis of the evaluation under para 680
- c. the practical application of the evaluation under para 680
- d. the relationship between the requirement in para 680(b) and the assumptions for moderator exclusion that may be used for Type IF, AF and Type BF packages under para 677
- e. the clarity and sufficiency of existing draft ST-2 guidance on para 680.

The WG-3 also recommends avoiding further delay in the issuance current draft of ST-2 . In order to clarify the issues as soon as possible, before the 2003 planned revision to ST-2, the WG-3 recommends that alternative means to disseminate timely guidance be investigated by the Secretariat.

Related issue

Although the test in para 680 is easy to meet for certain materials (e.g., low-enriched uranium), all certificates must be amended/updated to show test compliance. This results in an implementation problem as no competent authority currently approves under ST-1, and modal air organizations are making the Type C test mandatory starting 1/1/01 by adopting ST-1. There will apparently be a time period during which fissile material may not be shipped by air because the necessary package approval certificates may not be available.

(2) fissile material definition and exceptions

IP-14, "Comments by C.V. Parks of USA on definition of fissile material and exception criteria for packages containing fissile material," and IP-24, "Towards an Extension of the Definition of Fissile Material and Their Mass Exemption (sic) Limits," both describe recommendations regarding the definition of fissile material and fissile exception values. Also, NUREG/CR-5342 describes recommendations made to the U.S. NRC based upon the U.S. experience in implementing ST-1 fissile exception requirements. The U.S. has implemented current ST-1 fissile exception requirements since 1997. Regarding definitions, the current ST-1 definition of fissile material contains a limited number of isotopes. This may not reflect the future shipments of fissile actinide materials. Guidance is needed.

Proposal

The WG-3 reviewed these papers and finds that the issues are worthy of further consideration. The WG-3 recommends that these issues be picked up by a Member State and supported during the next revision cycle for ST-1.

(3) transport of consumer products

WP-13, "Ad-Hoc Communications with the Secretariat Concerning Consumer Products Containing Radioactive Material," IP-20, "Background Information on Consumer Products," and reference to draft NUREG-1717 describe an issue that has been identified for certain consumer products containing radioactive material (for example, light bulbs containing krypton-85), that have been used and shipped for many years without regard to their radioactivity. Apparently, imposing ST-1 will bring some of these shipments into the radioactive material transport regulations (for example, more than 10 lamps carried together [approximately 1 kBq]). Therefore, the lighting industry (and other consumer product industries) may legally be required to ship as radioactive material. WG-3 is in general agreement that there is not a safety issue, but there is a concern regarding the practice of making exceptions for certain types of shipments on a case-by-case basis. There is a dual aspect to the issue: it's true that some consumer products may have been

brought into regulation due to ST-1 implementation; but for other consumer products it may be that ST-1 publication has brought attention for the first time, to shipments that exceed the SS-6 70 Bq/g exemption standard.

It was noted that this issue only applies to shipments occurring before the end user purchase. Shipments of consumer products that have received regulatory approval, after sale to the end user, are not subject to ST-1 due to para 107.

There is a related issue concerning making a distinction between amount of exempt materials per consignment and issues surrounding use of a number of Type A packages per shipment (versus using one Type B package).

There are great numbers of consumer products in commerce, currently not shipped as radioactive material, but brought into ST-1. This would require marking "RADIOACTIVE," and the concern is that despite a negligible effect on safety, these products would be put into a considerable marketing disadvantage. This is also a BSS (SS-115) issue as to how to exempt these consumer products. BSS has an exemption for less than 10 $\mu\text{Sv/yr}$, there is no comparable exemption in ST-1. The issue of transport is closely linked to the issue of regulatory approval for use of these consumer products under the BSS (SS-115) approach. For example, there is also concern that such lamps and other consumer products must be collected and disposed of as waste. In order to justify introducing material into the market without controls, all of the consequences of the introduction (manufacture, transport, use, and disposal) should be known.

Some members of the WG-3 expressed an opinion that the economic impacts should not be the main driver regarding exempting materials, the decision should be made with a justifiable safety basis.

Several options for dealing with this issue were introduced, including:

- a. apply ST-1 to consumer products as it stands
(suboption: ship as limited quantity under para 518/Schedule 1)
- b. exempt consumer products from marking (like in para 517) and use Schedule 2
- c. extend the para 107 exemption to consumer product shipments *before* end-user sale
- d. reinvestigate the activity limit for an exempt consignment (column 5) values in Table I for consumer products
- e. include a 10 $\mu\text{Sv/yr}$ exemption in ST-1 that parallels the BSS

This is a generic problem, and discussing solutions for a single type of consumer product and single type of shipment is not the proper focus. Based on Nureg-1717, some WG-3 members noted there are some consumer products that should be addressed by the ST-1 requirements.

A modification of option b. was discussed that would permit a single product that receives regulatory approval and is within the activity limit for an exempt consignment (column 5) in Table I, to be exempt from marking requirements. A collected consignment of consumer products would be shipped under the ST-1 requirements. The following change to para 517(b) was submitted to WG-3, "Each instrument or article, (except a consumer product which has received regulatory approval according to para 107(d) - and with an

activity, that does not exceed the activity limit given in Table I, in Bq) bears the marking “RADIOACTIVE;” and,....”

Proposal

The WG-3 proposes that consumer products be shipped under Schedule 2 (instruments and articles) if the shipment is not otherwise exempt from ST-1 through para 107 or para 236. But the provision for not marking of radioluminescent timepieces should be extended to all individual consumer products having an activity that does not exceed the activity limit for an exempt consignment (column 5) given in Table I. In compensation for this change, if the activity per consignment exceeds the exempt quantity, the package (not the consumer product) should be marked with “RADIOACTIVE” on the inside of the package and the UN ID no. 2911 on the outside of the package, similar to what is done under Schedule 1. An individual consumer product that exceeds the activity limit for an exempt consignment (column 5) in Table I is not relieved from the “RADIOACTIVE” marking and is shipped under Schedule 2 (that consumer product’s activity could be up to the item limit in Schedule 2 Table 2.1).

WG-3 proposes that a Member State should introduce and support this approach as a revision to ST-1 during the next regular review cycle.

The practical effect of this approach is that (pre-consumer) shipments of multiple consumer products (e.g., shipments from distribution to a store) will be covered by ST-1, whereas, in the past, transportation of such material may not have been regulated based upon radioactivity considerations.

As a consequence of the above discussions, a general policy question was introduced. The question is, should the transport aspects of materials be regulated, when the materials or practices producing the material are otherwise exempt from regulation (due to the 10 μ Sv/yr criteria) under the BSS approach? Both the current situation and the WG-3 proposal appear result in such a situation. Para 107.3 in draft ST-2 appears to support the current approach. The WG-3 did not attempt to address this policy matter.

(4) multilingual labeling of packages

Mr. Köksal introduced an issue regarding the hazard communications requirements, specifically the marking and labeling of packages. It was asserted that the current SS-6 and ST-1 system for marking and labeling of packages lends itself to misunderstanding that results in radiological accidents during storage. Turkey experienced an accident in 1998 resulting from unsafe storage of radioactive material during transport, and people involved with the accident claimed to not understand the labels and package marking. Similar issues may have contributed to the recent accident in Thailand. Even though these may be ‘storage accidents,’ the marking and labeling that confronts a person finding the package containing a source results from the transport requirements.

Mr. Köksal’s proposal is that, to help prevent the severe radiation accidents caused by used teletherapy sources, the outside and inside of Type B packages bearing the sources must be durably marked and labeled in the language of the destination country, in addition to the labels and markings required by ST-1. The source container should also be labeled

with “DEATH DANGER” label and marked with the death danger sign (i.e., skull and cross-bones symbol). Note that only one set of additional communications would be necessary (the destination country language); the proposal does not intend to have such communications for each country through which the material moves.

The WG-3 discussed whether or not this would solve the issue even if the label or marking was in the language of the destination country. For example, the persons discovering a lost source may not understand the language or may not comprehend the hazard of radioactivity as indicated by the marking and label. Some WG-3 members pointed out that the system used by each country to control sources should also be considered and improvements to those systems may be a more efficient and more effective way to prevent such accidents. Proper management and disposal of sources, upon the end of their usefulness, is the key to solving this issue.

Some WG-3 members believe the use of the death danger symbol for radioactive materials, but not for other hazardous materials of equivalent risk, may unfairly single out Class 7 materials. Another point discussed by WG-3 was that it is not clear, in a practical sense, what sources would require the death danger symbol, because there are many assumptions that go into the modeling that would be needed to estimate health impacts of finding a source at some point in the future.

In addition, some countries appear to be more comfortable with current marking and labeling requirements, even though they are not in the native language. For example, communications in English and the trefoil symbol are generally understood in Germany, even though not in the native language. WG-3 believes that imposing such a requirement, on shipments to such countries, is overly burdensome and may create confusion where it currently doesn't exist.

The WG-3 believes that this issue is important, but it is best handled by proper quality assurance, management, and disposal of sources, upon the end of their usefulness, by the individual Member States. For example, individual Competent Authorities could inform those who may come into contact with these sources through its domestic regulations and certification (or revalidation) programs for the Type B packages used in its borders.

Proposal

WG-3 recommends that this issue not be taken up by the Secretariat as a transport safety issue.

(5) practical application of transport regulations

WP-14, “Report of the Consultant Services Meeting on Methodology and Topics to Address the practical Application of the Transport Regulations,” describes practical issues concerning classification of materials, special arrangement issues, mode-related issues, and other issues. The WG-3 discussed the issues in WP-14 (except for contamination which is covered by WG-1, and consumer products which is discussed above) as described in this section.

Classification of materials

Classification of materials is not an easy exercise under ST-1, and improper classification of materials could result in errors such as insufficient packaging, use of the wrong schedule, or not obtaining a required Competent Authority approval. The WG-3 discussed the need for additional guidance in this area. A determining factor is the question of whether or not Class 7 materials merit additional guidance as compared to other hazard materials classes (Class 1, Class 4, etc.). The consignor clearly has the responsibility for proper classification of material. WG-3 believes that Class 7 materials should be treated the same as other hazard Classes.

The schedules are good tool to perform the classification function and WG-3 consensus is that their incorporation into ST-1 is an improvement over the SS-6/SS-80 approach. However, WG-3 notes that the LSA and SCO schedules, in particular, are confusing, and the LSA and SCO requirements are unclear and subject to multiple interpretations. For example, LSA material and SCO definitions use subjective terms including distributed throughout and essentially uniformly distributed, and making an LSA/SCO determination requires determining inaccessible surface contamination levels and the unshielded dose rate at 1 meter. In practice, different consignors apply these requirements differently.

The WG-3 consensus is that practical guidance for LSA materials and SCO would be useful.

Special arrangements

There is a misunderstanding that shipments made under the special arrangement provisions of ST-1 are out of compliance with the regulations. An equivalent level of safety is provided for, when employing special arrangements. Special arrangements can be used if the requirements of the regulations are impractical to meet, and if the objectives of the regulations are fulfilled through alternative provisions. Shipment by air or vessel of packages with dose rate exceeding 2 mSv/hr at contact (even if exclusive use) requires special arrangement; in contrast, package dose rates on exclusive-use truck shipments could be 10 mSv/hr at contact. Shipment of large components such as steam generators are another example of special arrangements - packaging discarded steam generators as SCO-II is not viewed as practicable because the generator shell is superior to the IP-2 packaging that ST-1 would require. WG-3 notes that IP-6, "Report of the Consultant Services Meeting on Regulatory Issues Concerning LSA/SCO," recommends that the regulations be modified to accommodate large component transport as LSA/SCO rather than as special arrangement.

WP-14 notes that guidance on proper application of special arrangement provisions could facilitate their proper application, and enhance overall safety. This guidance could be developed for inclusion in future revisions to ST-2.

The WG-3 believes that a flexible tool to use with respect to meeting the requirements is appropriate, and the requirement for equivalent safety is appropriate. There should also be a tool (guidance) to decide between making multiple special arrangement shipments, as compared to initiating the process to amend the offending requirement. This would define better the situations in which special arrangements should be used, as compared to situations in which changes to the regulations should be sought.

Mode-related issues

WP-14 describes differences in labeling and marking requirements in ST-1, ADR, ICAO, and IMO. For international shipments, this could possibly result in a consignment being in non-compliance (for example, labeled improperly) during part of the shipment. In addition to the differences in the regulations, there are likely to be differences in the documentation used to implement the regulations. The WG-3 position is that ST-1 should be made to conform to the UN Orange Book for labeling. If the modal organizations also conform to the Orange Book, the requirements could become uniform. The normal ST-1 revision process should be used.

During the transitional period (after 1/1/01), different UN Numbers (from either SS-6 or ST-1) could be applied to a shipment. WG-3 notes that this could result in confusion, but does not have a specific recommendation.

Definitions (e.g., tank, freight container) also differ between the various modal requirements. The WG-3 position is that all ST-1 definitions should be made to consistent with the UN Orange Book definitions. The Orange Book has general definitions for all materials and specific definitions for radioactive material. The question concerns the consistency of the radioactive material definitions with the UN general definitions. If the modal organizations also adopt the UN document, the requirements could become uniform.

As for subsidiary risks, modal requirements do not appear to recognize that radioactive materials are not always the highest risk in the presence of other hazardous materials. Sometimes the 'subsidiary risk' requires more attention, but it is not clear when this is true amongst the different modal organizations. ST-1 does not need modification in this area, as it is very clear that one must address each hazard present. However, this issue should be brought up to the UN and modal organizations.

Acceptance issues were discussed. For example, should something be done to improve the acceptance of ST-1 by modal organizations or countries that refuse to accept certain ST-1 requirements or place restrictions in addition to ST-1. The source of these problems may be a lack of understanding of the requirements. There are likely other sources. WG-3 recognizes there is a need to increase communication and training at all levels with transport responsibilities (regulators, modal organizations, industry, responders, etc.), but WG-3 does not have a specific recommendation for the Secretariat.

Low activity concentration materials (ores)

WP-14 notes that some ores and concentrates that were previously exempted from the regulation (less than 70 Bq/g) will now be brought under ST-1 due to the adoption of radionuclide-specific exemption values in Table I. The extent of impact of this new requirement is not clearly known. But, the WG-3 notes that the radionuclide-specific exemption values in Table I are based on the BSS approach and their regulation as radioactive material may therefore be justified. There is a provision in ST-1 for ores and minerals to exceed the exemption concentrations by a factor of 10.

The WG-3 believes that if problems (e.g., economic) arise after implementation of ST-1,

that were unintended when ST-1 was formulated; the problems should be brought up by a Member State and introduced into the normal revision process. There is no specific WG recommendation.

Proposal

The WG-3 proposes that the Secretariat organize development of practical guidance for implementing the ST-1 requirements related to classifying materials, specifically for LSA materials and SCO.

The WG-3 proposes that some practical guidance should be given in future (2003) revisions of ST-2, with examples of situations in which using the special arrangement provisions are appropriate. However, this issue is not a pressing one and there is no need for interim guidance before this time.

The WG-3 proposes that ST-1 be revised, through the normal revision process, to be consistent with the UN Orange Book's labeling, marking, and placarding provisions. Further, a consultant's services should be obtained with the goal of revising the ST-1 definitions, through the normal revision process, to be consistent with those in the UN Orange Book. Finally, WG-3 recommends that the Secretariat investigate methods to resolve the issues surrounding the modal organizations' practices on subsidiary risks.

(6) Enhanced immersion performance of packages

WP-15, "Regulatory Issues Topics Proposed by France," describes a proposal to require certain Type B packages to survive an enhanced immersion test to a depth of 2000 m as compared to the currently required 200 m. Maximum fishing depths are stated in WP-15 to be in the 1000-2000 m range. WG-3 is not clear if this is intended to be a modal-specific or modal-independent proposal.

The WG-3 reviewed the information provided by the Secretariat and finds that the issues are worthy of further consideration. The WG-3 recommends that these issues be picked up by a Member State with proper justification and proposed language, and supported during the next normal revision cycle for ST-1. The WG-3 does not have a specific proposal.

(7) Two-year revision cycle

The move to a two year revision cycle for ST-1 was briefly discussed. It was clear that there are be implementation issues (e.g., grandfathering) that have not been clearly thought out.

The WG-3 supports the Secretariat moving to a revision cycle that matches that of the UN and modal organizations. The Secretariat should identify the implementation issues (e.g., grandfathering) that exist and should identify methods to facilitate the more-frequent revisions.

Proposals:

(1) regulations for the transport of fissile material by air

The WG-3 recommends that expert(s) be identified to develop additional guidance, for possible inclusion into a future revision to ST-2, regarding:

- a. the intent of the evaluation in ST-1 para 680
- b. the safety basis of the evaluation in ST-1 para 680
- c. the practical application of the evaluation in ST-1 para 680
- d. the relationship between the requirement in para 680(b) and the assumptions for moderator exclusion that may be used for Type IF, AF and Type BF packages under para 677
- e. the clarity and sufficiency of existing draft ST-2 guidance on para 680.

The WG-3 also recommends avoiding further delay in the issuance current draft of ST-2 . In order to clarify the issues as soon as possible, before the 2003 planned revision to ST-2, the WG-3 recommends that alternative means to disseminate timely guidance be investigated by the Secretariat.

(2) fissile material definition and exceptions

The WG-3 reviewed the information provided by the Secretariat and finds that the issues are worthy of further consideration. The WG-3 recommends that these issues be picked up by a Member State and supported during the next revision cycle for ST-1.

(3) transport of consumer products

The WG-3 proposes that consumer products be shipped under Schedule 2 (instruments and articles) if the shipment is not otherwise exempt from ST-1 through para 107 or para 236. But the provision for not marking of radioluminescent timepieces should be extended to all individual consumer products having an activity that does not exceed the activity limit for an exempt consignment (column 5) given in Table I. In compensation for this change, if the activity per consignment exceeds the exempt quantity, the package (not the consumer product) should be marked with “RADIOACTIVE” on the inside of the package and the UN ID no. 2911 on the outside of the package, similar to what is done under Schedule 1. An individual consumer product that exceeds the activity limit for an exempt consignment (column 5) in Table I is not relieved from the “RADIOACTIVE” marking and is shipped under Schedule 2 (that consumer product’s activity could be up to

the item limit in Schedule 2 Table 2.1).

WG-3 proposes that a Member State should introduce and support this approach as a revision to ST-1 during the next regular review cycle.

(4) multilingual labeling of packages

WG-3 recommends that this issue not be taken up by the Secretariat in the transport arena.

(5) practical application of transport regulations

There are multiple recommendations for various issues in this topical area:

- a. The WG-3 proposes that the Secretariat organize development of practical guidance related to implementing the ST-1 requirements classifying materials, specifically for LSA materials and SCO.
- b. The WG-3 proposes that some practical guidance should be given in future (2003) revisions of ST-2, with examples of situations in which using the special arrangement provisions are appropriate. However, this issue is not a pressing one and there is no need for interim guidance before this time.
- c. The WG-3 proposes that ST-1 be revised, through the normal revision process, to be consistent with the UN Orange Book's labeling, marking, and placarding provisions. Further, a consultant's services should be obtained with the goal of revising the ST-1 definitions, through the normal revision process, to be consistent with those in the UN Orange Book. Finally, WG-3 recommends that the Secretariat investigate methods to resolve the issues surrounding the modal organizations' practices on subsidiary risks.

(6) Enhanced immersion performance of packages

The WG-3 reviewed the information provided by the Secretariat and finds that the issues are worthy of further consideration. The WG-3 recommends that these issues be picked up by a Member State with proper justification and proposed language, and supported during the next normal revision cycle for ST-1. The WG-3 does not have a specific proposal.

(7) Two-year revision cycle

The WG-3 supports the Secretariat moving to a revision cycle that matches that of the UN and modal organizations. The Secretariat should work to identify the implementation issues (e.g., grandfathering) that exist, and should identify methods to facilitate the more-frequent revisions.

**Report of the Writing Group on Transport Safety
Regulation-Specific Issues**

1. Terms of Reference

A writing group was formed as part of TC-1156 to address two Transport Safety Regulations-specific issues. The group was to address the two issues and prepare possible text to be considered by a Member State for submittal as proposed regulatory changes to the Agency as part of the forthcoming revision which will lead to publication of revised Agency Regulations in 2003. The two issues addressed by the writing group are:

Ability of the Agency to interpret its own Transport Regulations, and

Actions to be taken in the event of non-compliance with the Transport Regulations.

2. Writing Group Discussions

The writing group met on Tuesday, 07 March 2000. It considered

Working Paper No. 4,
Working Paper No. 11, and
Information Paper No. 4.

The writing group discussed the two issues, and prepared proposed text for consideration by a Member State to submit as potential changes to the Transport Regulations.

In addition, the writing group completed the forms for these proposals, which are included as Appendix 1 and Appendix 2.

The writing group consisted of the following personnel:

C. Young, UK (Leader)
L. Blalock, USA
R. Pope, IAEA

Revision 2 of this document reflects the discussion in Plenary.

Writing Group Actions

Relative to the two issues assigned to this writing group the following actions and recommendations were taken.

3.1 Discussion of Actions Needed on Ability of the Agency to Provide Interpretation of its own Transport Regulations

As was noted in Working Paper No. 11, the Agency undertook the development of a document on the non-fixed contamination issue in August 1999. This document was to be presented in September 1999 either to the Board of Governors or the General Conference. However, it became apparent that the Agency's Transport Regulations (ST-1, 1996 Edition) does not contain provisions that allow the Director General of the Agency to interpret its own regulations. As a result, the Agency was unable to complete this document.

In contrast, the *Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources* (1996 Edition of Safety series No. 115) contains provisions allowing the Director General to interpret those safety standards. The text in the Basic Safety Standards which allows the Director General to interpret that Safety Standard is found in Principal Requirements, Section 1, General Requirements, in para. 1.21. This paragraph reads as follows:

1.21. Except as specifically authorized by the statutory Governing Body of a relevant Sponsoring Organization, no interpretation of the Standards by any officer or employee of the Sponsoring Organization other than a written interpretation by the Director General of the Sponsoring Organization will be binding on the Sponsoring Organization.

It is noted that the above text reflects the fact that Safety Series No. 115 is co-sponsored and jointly issued by multiple international organizations, whereas the Transport Regulations (currently Safety Series Standards ST-1, 1996 Edition) are only sponsored and issued by the IAEA. Therefore, should text such as para 1.21 of Safety Series No. 115 be proposed for inclusion in the next revision of the Transport Regulations, it should be modified to reflect the single sponsorship of the Transport Regulations by the Agency.

Based on the preceding, the writing group recommends that text, similar to that shown above from Safety Series No. 115 but modified to reflect the single sponsorship of the Agency, be proposed for inclusion in the next edition of the Transport Regulations. The proposed text is as follows:

No interpretation of these transport safety requirements by any officer or employee of the International Atomic Energy Agency, other than a written interpretation under the authority of the Director General of the Agency and developed in consultation with the Transport Safety Standards Advisory Committee (TRANSSAC), will be binding on the Agency. Any interpretation shall be issued by the Transport Safety Unit of the Agency. The authority to interpret or develop interpretations of these transport safety requirements may be delegated by the Director General of the Agency.

The writing group also considered where, in the revised Transport Regulations, this statement should appear. The following recognizes that as the next revision proceeds, the structure may change significantly, but the considerations here were focused on the existing structure. In addition, the writing group recognized that TC-405.8 recommended that a preamble, similar to that in Safety Series No. 115, be included in the next edition of the Transport Regulations.

The interpretation text could be included in the preamble, but might appear to be non-binding if placed there. Alternatively, considering the existing structure of ST-1, the text could be included either in the “Introduction” (Section I), after “Scope”, or at the end of “General Provisions” (Section III).

The writing group recommends that the text on interpretation be included at the end of the “General Provisions” section of the Regulations.

3.2 Discussion on Actions Needed for Non-compliance

The Plenary of TC-1156 reviewed the recommendations made in various working papers concerning the need for text in the Transport Regulations for required actions in the event of non-compliance. This was prompted by the recent events in Europe relative to non-fixed contamination on packages and conveyances. However, Plenary agreed that non-compliance related text should address any non-compliance situation, not just one involving contamination.

The writing group considered the non-compliance and other related text in Safety Series No. 115, which was included in Information Paper No. 4. From this text, the following is proposed as text for consideration for inclusion in the next revision of the Transport Regulations. The location of this text is recommended to be in the “General Provisions” section of the Transport Regulations, following “Special Arrangement”.

In addition, Working Group No. 1 requested the Writing Group to consider adding text concerning “*safety culture*” in the proposed requirements and advisory material on non-compliance. The writing group discussed this and concluded that such text does not belong in the regulatory text proposed below, but may better be placed either in the Preamble which was proposed by TC-405.8, as part of the advisory material, or both. Advisory text discussing safety culture is included in the proposed text of Appendix 2.

The proposed text is as follows (NOTE: the text that was proposed in Section 3.1 above concerning interpretation would then follow the proposed non-compliance text as is shown below):

NON-COMPLIANCE

312 bis. *In the event of a non-compliance of any applicable requirement of these safety requirements, the consignor shall be informed by*

- (a) the carrier if the non-compliance is identified during transport, or*
- (b) the consignee if the non-compliance is identified at receipt.*

312 bis+1. *The carrier, consignor or consignee shall, as appropriate:*

- (a) investigate the non-compliance and its causes, circumstances and consequences;*
- (b) take appropriate action to remedy the causes and circumstances that led to the non-compliance*
- (c) take appropriate action to prevent a recurrence of similar circumstances that led to the non-compliance*
- (d) communicate to the relevant competent authority(ies) on the causes of the non-compliance and on the corrective or preventive actions taken or to be taken; and*
- (e) take whatever other actions are necessary as required by these safety requirements.*

312 bis+2. *The communication of a non-compliance in paras 312 bis and 312 bis+1 to the consignor and relevant competent authority(ies) shall be prompt and it shall be immediate whenever an emergency exposure situation has developed or is developing.*


312 bis+3. *Failure to take corrective or preventive actions in accordance with national regulations shall be grounds for appropriate action by the relevant competent authority(ies).*


312 bis+4. *Wilful non-compliance of, attempted non-compliance of, or conspiracy to not comply with any of these safety requirements shall be subject to the provisions for such infractions by the appropriate competent authority(ies) or, when applicable, by the relevant consignor.*


INTERPRETATION

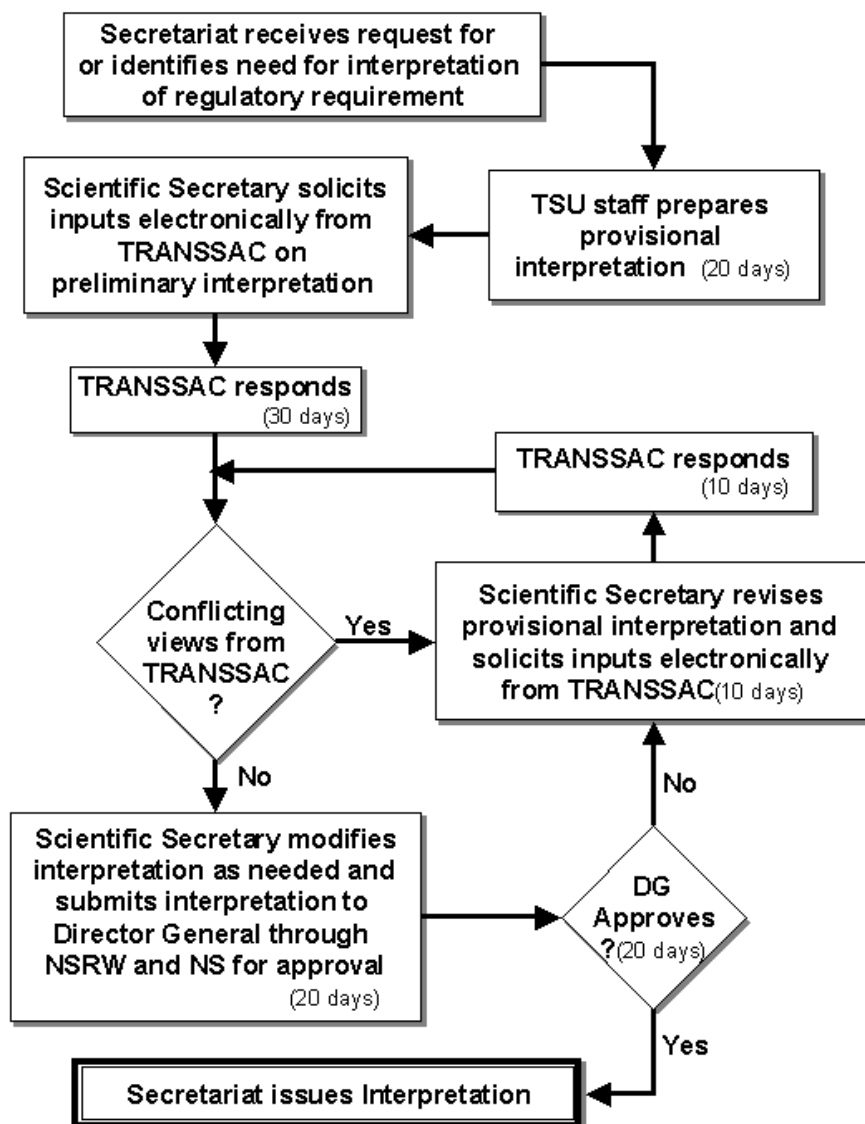
312 bis+5. *No interpretation of these transport safety requirements by any officer or employee of the International Atomic Energy Agency, other than a written interpretation under the authority of the Director General of the Agency and developed in consultation with the Transport Safety Standards Advisory Committee (TRANSSAC), will be binding on the Agency. Any interpretation shall be issued by the Transport Safety Unit of the Agency. The authority to interpret or develop interpretations of these transport safety requirements may be delegated by the Director General of the Agency.*

APPENDIX 1 – Proposed Changes for Interpretation


<p>Proposed Change to the 1996 Edition of the International Atomic Energy Agency Transport Regulations (ST-1) and/or its associated Guidance Documents (ST-2 and ST-3) For Consideration by the September 2000 Revision Panel</p>	
<p style="text-align: center;">Proposed Change Submitted by: (1)</p> <p>Name: Address: Telephone: Telefax: E-mail:</p>	<p style="text-align: center;"><u>Proposal Reference</u> <u>Number (2)</u> <small>(to be assigned by the IAEA Secretariat)</small></p>
<p style="text-align: right;">Type of Change (3.1)</p> <p>Minor Change <input type="checkbox"/> Change of Detail <input type="checkbox"/> Major Change <input checked="" type="checkbox"/></p>	
<p><u>Topic of Proposed Change (3.2)</u> (Provide brief summary statement on topic of proposed change with one or more key words associated with the topic) Proposed new requirement concerning Agency's ability to interpret its own regulations.</p>	
<p><u>Principal Objective of Proposed Change (3.3)</u> (Check boxes as appropriate)</p> <p><input type="checkbox"/> Necessary to provide adequate protection to health and safety of public and occupational workers <input type="checkbox"/> Involves defining or redefining level of protection to health and safety of public and occupational workers <input checked="" type="checkbox"/> Required for consistency within the Regulations <input type="checkbox"/> Required as a result of advances in technology <input checked="" type="checkbox"/> Needed to improve implementation of the Regulations <input type="checkbox"/> Other (specify) _____</p>	
<p><u>Paragraphs Affected and Proposed Text Changes to ST-1 (3.4)</u> (Provide new text for ST-1 and a listing of the paragraphs affected. Where appropriate identify where existing text is to be modified or deleted.) INTERPRETATION <i>312 bis+5. No interpretation of these transport safety requirements by any officer or employee of the International Atomic Energy Agency, other than a written interpretation under the authority of the Director General of the Agency and developed in consultation with the Transport Safety Standards Advisory Committee (TRANSSAC), will be binding on the Agency. Any interpretation shall be issued by the Transport Safety Unit of the Agency. The authority to interpret or develop interpretations of these transport safety requirements may be delegated by the Director General of the Agency.</i></p>	
<p><u>Paragraphs Affected and Proposed Text Changes to ST-2 (3.5)</u> (Provide a listing of the paragraphs affected, details on proposed change, and modified text to appropriate paragraphs in ST-2)</p>	

<p>Proposed Change to the 1996 Edition of the International Atomic Energy Agency Transport Regulations (ST-1) and/or its associated Guidance Documents (ST-2 and ST-3) For Consideration by the September 2000 Revision Panel</p>	
<p align="center">Proposed Change Submitted by: (1)</p> <p>Name: Address:</p> <p>Telephone: Telefax: E-mail:</p>	<p align="center"><u>Proposal Reference</u> <u>Number (2)</u> <small>(to be assigned by the IAEA Secretariat)</small></p>
<p><i>(312 bis+5).1. It was determined in 1999 that the ability of the Director General of the Agency to interpret the requirements in the Transport Regulations needed to be formalized. The ability is needed so effective actions can be taken when mis-interpretations are made by those applying the Regulations, or the existing text is unclear and advice and interpretation on how to apply a specific requirement or set of requirements is needed before the next edition of the Regulations can be completed and published.</i></p> <p><i>(312 bis+5).2. As used in the Regulations, the term “interpretation” refers to clarification of meaning of major requirements as they were derived from the broad concepts, parameters and limits used in the development of specific topics in the Regulations (e.g., non-fixed contamination). It does not include the type of guidance frequently provided by the Secretariat or Member State competent authorities concerning the manner in which specific, detailed requirements in the Regulations are to be accomplished by consignors, carriers, or consignees.</i></p> <p><i>(312 bis+5).3. The following chart illustrates the process which will be used by the Agency in developing a consensus interpretation of a requirement in the Transport Regulations, in obtaining approval by TRANSSAC and the Director General of that interpretation, and issuing it in a fashion that it will be readily available to all concerned parties.</i></p> <p>[For the chart, see continuation pages]</p>	
<p><u>Paragraphs Affected and Proposed Text Changes to ST-3 (3.6)</u> (Provide a listing of the paragraphs affected, details on proposed change, and modified text to appropriate paragraphs in ST-3)</p> <p>None</p>	
<p><u>Justification for Proposed Change (3.7)</u> (Provide details on justification for the proposed change. For a proposed major change, include an assessment of how it affects risk and a value impact. Use additional pages as needed)</p> <p>Events which occurred during 1998 and 1999 illustrated that the Agency’s Transport Regulations (ST-1, 1996 Edition) does not contain provisions allowing the Director General of the Agency to interpret its own regulations. As a result, the Agency was unable to provide an interpretation of a controversial issue even to its on Board of Governors and General Conference.</p> <p>In contrast, the <i>Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources</i> (1996 Edition of Safety series No. 115) contains provisions allowing the Director General to interpret those safety standards.</p>	

Proposed Change to the 1996 Edition of the International Atomic Energy Agency Transport Regulations (ST-1) and/or its associated Guidance Documents (ST-2 and ST-3) For Consideration by the September 2000 Revision Panel	
<p align="center">Proposed Change Submitted by: (1)</p> <p>Name: Address:</p> <p>Telephone: Telefax: E-mail:</p>	<p align="center"><u>Proposal Reference</u> <u>Number (2)</u> <i>(to be assigned by the IAEA Secretariat)</i></p>
<p>This proposal addresses the interpretation problem and provides recommended text for both ST-1 and ST-2 to resolve this outstanding issue.</p> <p><u>Complexity:</u> This proposed change adds a minor complexity to the Regulations and to the activities to be undertaken by the Agency.</p> <p><u>Policy Significance:</u> Adoption of this proposal will greatly enhance the ability of the Secretariat to be responsive to the needs of the Member States when questions arise concerning the requirements in the Regulations.</p> <p><u>Value/Impact assessment:</u> The value of this change will greatly exceed the costs. By being able to provide formal interpretations of requirements in a timely fashion, many cost which might otherwise be incurred by Member State competent authorities, consignors and carriers could be avoided. The added costs to the operation of the Transport Safety Unit and to members of TRANSSAC are expected to be small.</p> <p><u>Immediate need:</u> As questions arise concerning the proper interpretation of regulatory requirements, there is a need to have those interpretations provided in a timely fashion. Implementation of this proposal will facilitate those timely interpretations.</p>	
<p>Number of Continuation Sheets Used: 1</p> <p>Continuation Sheet Number 1</p> <p>See following attached page with proposed figure.</p>	



ANNEX 2 – Proposed Changes for Non-Compliance

Proposed Change to the 1996 Edition of the International Atomic Energy Agency Transport Regulations (ST-1) and/or its associated Guidance Documents (ST-2 and ST-3) For Consideration by the September 2000 Revision Panel	
Proposed Change Submitted by: (1) Name: Address: Telephone: Telefax: E-mail:	<u>Proposal Reference Number (2)</u> <i>(to be assigned by the IAEA Secretariat)</i>
<div style="text-align: right;">Type of Change (3.1)</div> Minor Change <input type="checkbox"/> Change of Detail <input type="checkbox"/> Major Change <input checked="" type="checkbox"/>	
<u>Topic of Proposed Change (3.2)</u> (Provide brief summary statement on topic of proposed change with one or more key words associated with the topic) Proposed new requirement concerning actions required in the event of non-compliance with the requirements in the Transport Regulations.	
<u>Principal Objective of Proposed Change (3.3)</u> (Check boxes as appropriate) <input checked="" type="checkbox"/> Necessary to provide adequate protection to health and safety of public and occupational workers <input type="checkbox"/> Involves defining or redefining level of protection to health and safety of public and occupational workers <input type="checkbox"/> Required for consistency within the Regulations <input type="checkbox"/> Required as a result of advances in technology <input checked="" type="checkbox"/> Needed to improve implementation of the Regulations <input type="checkbox"/> Other (specify) _____	
<u>Paragraphs Affected and Proposed Text Changes to ST-1 (3.4)</u> (Provide new text for ST-1 and a listing of the paragraphs affected. Where appropriate identify where existing text is to be modified or deleted. See Continuation Sheet Number 1	
<u>Paragraphs Affected and Proposed Text Changes to ST-2 (3.5)</u> (Provide a listing of the paragraphs affected, details on proposed change, and modified text to appropriate paragraphs in ST-2) See continuation sheet number 2	
<u>Paragraphs Affected and Proposed Text Changes to ST-3 (3.6)</u> (Provide a listing of the paragraphs affected, details on proposed change, and modified text to appropriate paragraphs in ST-3) None	

**Proposed Change to the 1996 Edition of the International Atomic Energy Agency Transport Regulations (ST-1) and/or its associated Guidance Documents (ST-2 and ST-3)
For Consideration by the September 2000 Revision Panel**



Proposed Change Submitted by: (1)

Name:
Address:

Telephone:
Telefax:
E-mail:

Proposal
Reference
Number (2)
(to be assigned by the IAEA Secretariat)

Justification for Proposed Change (3.7)

(Provide details on justification for the proposed change. For a proposed major change, include an assessment of how it affects risk and a value impact. Use additional pages as needed)

As a result of the non-compliance with contamination requirements experienced in Europe during 1998 and 1999, and the resulting shutdown of transport of irradiated fuel shipments, the IAEA convened two consultancies during 1999 which dealt with the contamination issue, and followed this with TC-1156 in March 2000. It was recommended by these meetings that text addressing requirements for actions needed in the event of non-compliance be added to the Transport Regulations. Furthermore, TC-1156 recommended that any new non-compliance related text should address any non-compliance situation, not just one involving contamination.

This proposed revision provides text recommended by TC-1156, which also recommended that it be added (under the structure of the 1996 Edition of ST-1) in the "General Provisions" section of the Transport Regulations, following "Special Arrangement".


This proposal addresses the non-compliance problem and provides recommended text for both ST-1 and ST-2 to resolve this outstanding issue.


Complexity: This proposed change adds a minor complexity to the Regulations and to the activities to be undertaken by the Agency. It could add additional requirements on both competent authorities and users of the Regulations (consignors, carriers and consignees).

Policy Significance: Adoption of this proposal will greatly enhance the ability of the competent authorities to enforce the Transport Regulations effectively, and to act appropriately against those who do not comply with the regulatory requirements.

Value/Impact assessment: The value of this change is expected to exceed any costs. By being able to define steps needed when non-compliance occurs, public and political confidence in the Regulations should be enhanced, and the legal framework for a more sound enforcement programme will be established. The added costs to the operation of the competent authorities is expected to be small, but the benefits to those operations should be large.

Immediate need: As non-compliances occur, there is a need to have action and accurate information concerning those non-compliances provided in a timely fashion to the appropriate bodies (e.g., consignor, carrier, consignee and competent authority(ies)). Implementation of this proposal will facilitate those timely actions.

<p>Proposed Change to the 1996 Edition of the International Atomic Energy Agency Transport Regulations (ST-1) and/or its associated Guidance Documents (ST-2 and ST-3)</p> <p>For Consideration by the September 2000 Revision Panel</p>	
<p align="center">Proposed Change Submitted by: (1)</p> <p>Name: Address:</p> <p>Telephone: Telefax: E-mail:</p>	<p align="center"><u>Proposal</u> <u>Reference</u> <u>Number (2)</u> <small>(to be assigned by the IAEA Secretariat)</small></p>
<p>Number of Continuation Sheets Used: 2</p>	
<p>Continuation Sheet Number 1 Proposed new Regulatory text: NON-COMPLIANCE</p> <p><i>312 bis. In the event of a non-compliance of any applicable requirement of these safety requirements, the consignor shall be informed by</i> <i>(c) the carrier if the non-compliance is identified during transport, or</i> <i>(d) the consignee if the non-compliance is identified at receipt.</i></p> <p><i>312 bis+1. The carrier, consignor or consignee shall, as appropriate:</i> <i>(a) investigate the non-compliance and its causes, circumstances and consequences;</i> <i>(f) take appropriate action to remedy the causes and circumstances that led to the non-compliance</i> <i>(g) take appropriate action to prevent a recurrence of similar circumstances that led to the non-compliance</i> <i>(h) communicate to the relevant competent authority(ies) on the causes of the non-compliance and on the corrective or preventive actions taken or to be taken; and</i> <i>(i) take whatever other actions are necessary as required by these safety requirements.</i></p> <p><i>312 bis+2. The communication of a non-compliance in paras 312 bis and 312 bis+1 to the consignor and relevant competent authority(ies) shall be prompt and it shall be immediate whenever an emergency exposure situation has developed or is developing.</i></p> <p><i>312 bis+3. Failure to take corrective or preventive actions in accordance with national regulations shall be grounds for appropriate action by the relevant competent authority(ies).</i></p> <p><i>312 bis+4. Wilful non-compliance of, attempted non-compliance of, or conspiracy to not comply with any of these safety requirements shall be subject to the provisions for such infractions by the appropriate competent authority(ies) or, when applicable, by the relevant consignor.</i></p>	
<p>Number of Continuation Sheets Used: 2</p>	

<p>Proposed Change to the 1996 Edition of the International Atomic Energy Agency Transport Regulations (ST-1) and/or its associated Guidance Documents (ST-2 and ST-3)</p> <p>For Consideration by the September 2000 Revision Panel</p>	
<p align="center">Proposed Change Submitted by: (1)</p> <p>Name: Address:</p> <p>Telephone: Telefax: E-mail:</p>	<p align="center"><u>Proposal</u> <u>Reference</u> <u>Number (2)</u> <small>(to be assigned by the IAEA Secretariat)</small></p>
<p>Continuation Sheet Number 2 Proposed new Advisory text:</p> <p><i>(312 bis).1. The standards prescribed by the Regulations, when complied with by the consignor, carrier, and consignee, result in a safety culture ensuring very high levels of safety for the transport of radioactive material. Paras 312 bis – 312 bis+4 of the Regulations recognize that non-compliances can occur and that national or international organizations should establish programmes to investigate, analyze and institute remedial actions.</i></p> <p><i>(312 bis).2. As used in the Regulations, the term “non-compliance” has a very broad meaning which includes any and all situations (except transport accidents) where a shipment is not in full accordance with the applicable regulatory requirements.</i></p> <p><i>(312 bis).3. An effective compliance assurance programme should, as a minimum, have objectives related to non-compliance detection and analysis of:</i></p> <p><i>(a) providing feedback to the regulatory process as a basis for improvements in the Regulations and the compliance assurance (para. 311) programme; and</i></p> <p><i>(b) ensuring that adequate and appropriate communications and feedback are facilitated between the consignor, carrier, consignee and appropriate competent authority(ies) concerning any non-compliance so as to ensure that such occurrences are eliminated in the future.</i></p>	